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(54) **HALF TONING METHOD FOR GRAY SCALE IMAGE AND DEVICE HAVING HALF TONING MEANS FOR GRAY SCALE IMAGE**

each small area at which the dispersion value is the least, and a result recording section 304 records a threshold of a dither matrix corresponding to the position.

(57) Abstract:

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**PROBLEM TO BE SOLVED:** To improve the processing speed, to simplify the algorithm and to ensure high image quality of a half tone image by developing the algorithm by which a dither matrix in use is generated more simply and higher image quality is ensured in the half toning of a gray scale image using a systematic dither matrix of random dispersion type.

**SOLUTION:** The dispersion in inter-pixel distance sets in a dot pattern is used for a characteristic quantity to generate a dither matrix. A decision section 301 for a small area where the number of black level pixel is to be increased divides a dot pattern into a plurality of small areas and decides small areas where the number of black level pixels is to be increased according to the order denoted by a threshold of a Bayer matrix. An inter-pixel distance dispersion calculation section 302 calculates the dispersion of the distance of all white level pixels in the decided small areas by taking weight coefficients into account. A minimum dispersion discrimination section 303 discriminates a position in

